

Flash 3D Planetary Entry, Descent and Landing Sensor Hardening, Phase II

Completed Technology Project (2009 - 2012)



Project Introduction

Advanced Scientific Concepts Inc. (ASC) is a small business that has developed a number of 3D flash LADAR systems. Flash Ladar Video Cameras are 3D video cameras that return range and intensity information for each pixel in real time, and is functionally equivalent to 16000 range finders on one chip. Actual data collected, at the JPL mars yard, using ASC's compact Flash Ladar system demonstrated in a previous NASA phase I SBIR effort confirm that the ASC Flash LADAR Video Camera (FLVC) system can meet the requirements for Entry, Descent and Landing (EDL). The FLVC's small size, low power and very fast range data frame rate (30Hz) the sensor can be configured for a variety of EDL missions. An existing Phase two effort is fabricating a compact FLVC for delivery to NASA for field testing, however the system is not hardened. The proposed Phase 2 effort will produce a space qualified sensor engine which can be integrated with the system being delivered to NASA. The sensor engine is the break-through enabling technology for the FLVC. The sensor engine will be fabricated, tested and used to upgrade the camera JPL. As a result of these improvements, the TRL level of this sensor will be at 6-7. Flash Ladar is ideal for determining real-time spacecraft trajectory, speed and orientation to the planet surface, as well as evaluating potential hazards at the landing site is required for precision landing. Sloped ground, craters, rocks and surface composition are among the potential hazards. The "framing camera" nature, of Flash LADAR systems, makes them well suited as hazard avoidance sensors for EDL. Flash LADAR can provide a direct, real-time measurement of the altitude of the spacecraft during descent as well as surface relative velocity and orientation, while simultaneously mapping the topography of the terrain below to identify landing hazards and provide localization information.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

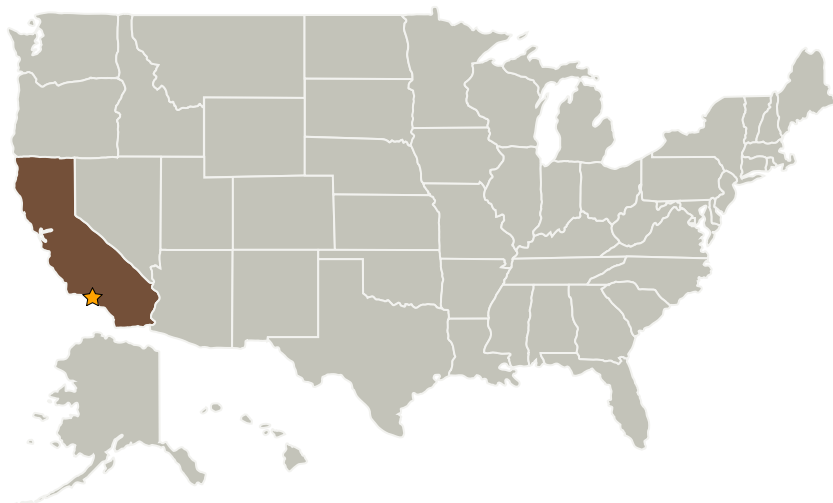
Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations and Key Partners



Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
 - └ TX15.2 Flight Mechanics
 - └ TX15.2.3 Flight Mechanics Testing and Flight Operations

Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
Advanced Scientific Concepts, Inc.	Supporting Organization	Industry	Goleta, California

Primary U.S. Work Locations

California

Project Transitions

**February 2009:** Project Start**April 2012:** Closed out